



CRITICAL HABITAT AREAS OF PEPPERMILL LAKE, ADAMS COUNTY, WISCONSIN

**Submitted by Reesa Evans,
Adams County Land & Water Conservation Department
P.O. Box 287, Friendship, WI 53934
608-339-4268**

CRITICAL HABITAT DESIGNATION For Peppermill Lake, Adams County 2006

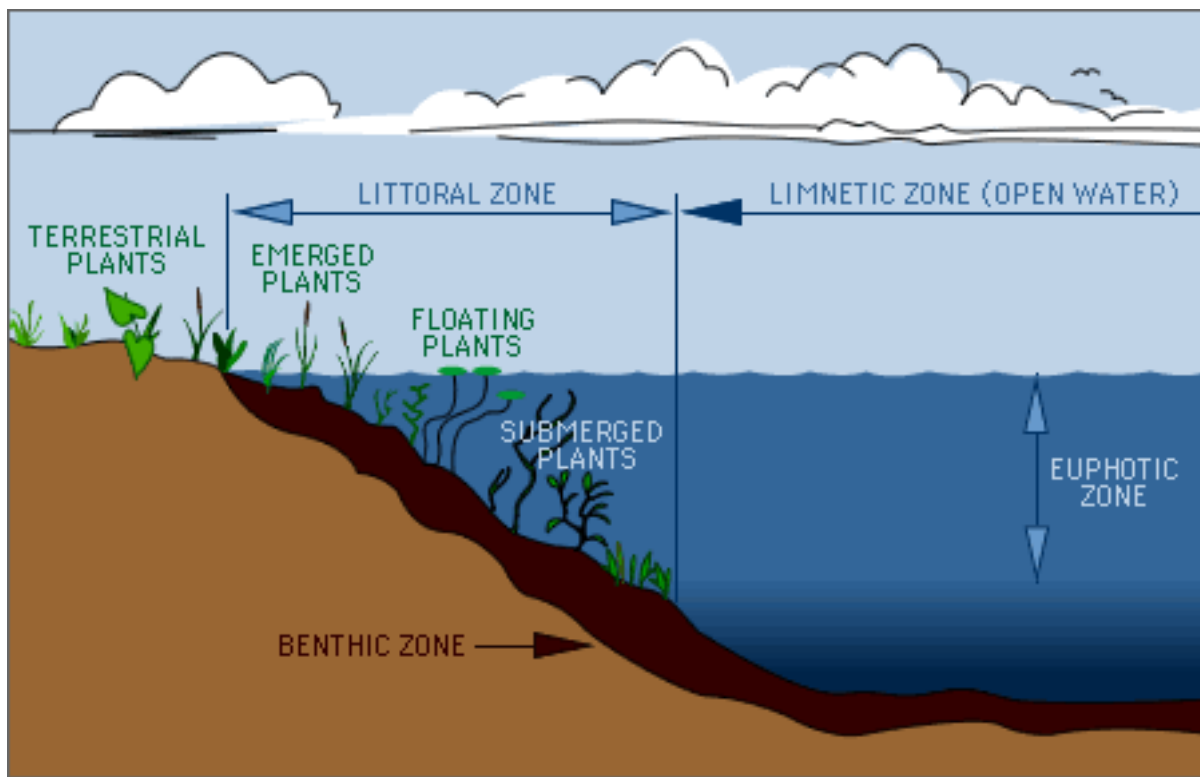
I. INTRODUCTION

Designation of critical habitat areas within lakes provides a holistic approach for assessing the ecosystem and for protecting those areas in and near a lake that are important for preserving the qualities of the lake. Wisconsin Rule 107.05(3)(i)(I) defines a “sensitive areas” as: “areas of aquatic vegetation identified by the department as offering critical or unique fish & wildlife habitat or offering water quality or erosion control benefits to the body of water. Thus, these sites are essential to support the wildlife and fish communities. They also provide mechanisms for protecting water quality within the lake, often containing high-quality plant beds. Finally, sensitive areas often can provide the peace, serenity and beauty that draw many people to lakes in the first place.

Protection of critical habitat areas must include protecting the shore area plant community, often by buffers of native vegetation that absorb or filter nutrient & stormwater runoff, prevent shore erosion, maintain water temperature and provide important native habitat. Buffers can serve not only as habitats themselves, but may also provide corridors for species moving along the shore.

Besides protecting the landward shore areas, preserving the littoral (shallow) zone and its plant communities not only provides essential habitat for fish, wildlife, and the invertebrates that feed on them, but also provides further erosion protection and water quality protection.

Critical habitat area designations provide information that can be used in developing a management plan for the lake that protects the lake’s ecosystem by identifying areas in need of special protection. These areas usually contain several types of aquatic plants: emergent; floating-leaf; rooted floating-leaf; and submergent.



Field work for a critical habitat area study was performed on October 4, 2006, on Peppermill Lake, Adams County. The study team included: Scot Ironside, DNR Fish Biologist; Deborah Konkel, DNR Aquatic Plant Specialist; and Reesa Evans, Adams County Land & Water Conservation Department. Areas were identified visually, with GPS readings and digital photos providing additional information. Input was also sought from Terry Kafka, DNR Water Regulation; Jim Keir, DNR Wildlife Biologist; and Buzz Sorge, DNR Lake Manager.

Peppermill Lake is a mesotrophic/oligotrophic impoundment with good to very good water quality and very good water clarity. It has 100 surface acres, with a maximum depth of 14 feet and an average depth about 6 feet. Peppermill Lake is at the head of a stream subsystem that flows eventually into the Fox River and Lake Michigan. There is a public boat ramp on the northeast end of the lake owned by the Town of Jackson. The dam is owned by Adams County and managed by the Adams County Land & Water Conservation Department.

II. CRITICAL HABITAT CRITERIA

All the critical habitat areas on Peppermill Lake were selected because of their importance for fish and wildlife habitat, importance for protecting water quality, importance of the natural buffer of terrestrial vegetation, and importance of protecting the aquatic plant communities they supported. Each of these sites needs to be preserved in their current natural state and should not be further developed. All of the sites have potential to be used for educational purposes.

Common Attributes of All the Critical Habitat Areas

Water Quality: The vegetation at these sites (near shore and in the water) provides a nutrient buffer that reduces algal growth. Its service as a biological buffer reduces the opportunities for invasions by exotics. The physical buffer the vegetation gives protects against shore erosion and plant fragmentation, as well as stabilizes sediment, thus reducing nutrient recycling and likelihood of algal blooms. Many of these plant areas also provide microhabitat for fish and wildlife, as well as providing conditions that encourage higher biodiversity at the site.

Fish Habitat: All of these critical habitat areas provide important fish habitat and are the most essential areas in the lake for a healthy fish community. These areas provide space for spawning, nursery sites, feeding sites, and protective cover from predator fish. Eliminating even one of these sites would reduce the amount of fish habitat available, resulting in a reduction of the size and diversity of the fish community that Peppermill Lake can support.

Wildlife Habitat: Shoreline, emergent and floating-leaf vegetation are primary habitat for many kinds of wildlife. Shore and emergent vegetation are especially important as nesting and brood-rearing areas. This vegetation also provides cover during migrations and provides travel corridors all throughout the year. Floating-leaf vegetation also provides cover. Most of this vegetation is also used by various fish and other wildlife for food.

A map of the designated critical habitat areas on Peppermill Lake is seen on the next page.

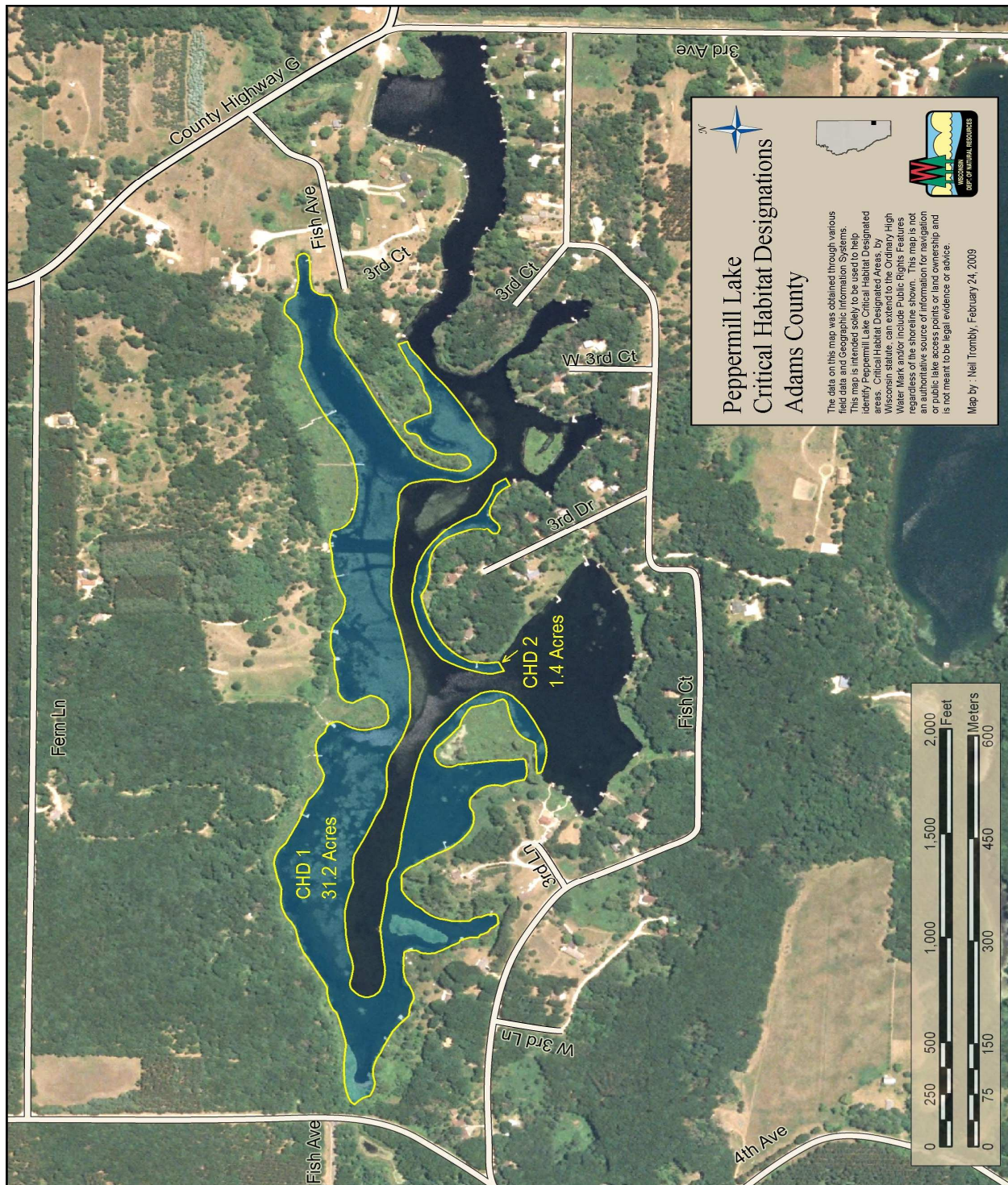


Figure 2. Critical Habitat Designated Areas

Critical Habitat Area PE1

This area extends along approximately 7000 feet of the shoreline up to the ordinary high water mark, comprised of about 2/3 of the northern shore of the lake and the southwest shore of the lake. Sediment includes marl, muck, peat, silt and mixtures thereof. 12% of the shore is wooded; 61% has shrubs; 27% is native herbaceous cover. Shrub-carr is found along part of the shore. Large woody cover is common for habitat. With minimal human disturbance along this shoreline, the area has natural scenic beauty.



This area of large woody cover, emergent aquatic vegetation, submergent and floating vegetation provides spawning and nursery areas for many types of fish: northern pike; largemouth bass; rock bass; bluegill; pumpkinseed; yellow perch; black crappie; bullhead; white suckers, and other panfish. All of these fish also feed and take cover in these areas. No exotic aquatic wildlife was noted in this area, i.e, no carp, smelt or rusty crayfish were seen.

Muskrat and mink are also known to use this habitat for cover, reproduction and feeding. Seen during the field survey were various types of songbirds. Frogs and salamanders are known to use this area for shelter/cover, nesting and feeding. Turtles and snakes also use this area for cover or shelter in this area, as well as nested and fed in this area. Upland wildlife feed and nest here as well. Since human disturbance is light in PE1, it provides quality habitat for many types of wildlife. The wildlife biologist indicated that should this shoreline become more developed, its habitat value will be limited.



Maximum rooting depth of aquatic vegetation in PE1 was 7.5 feet. Several types of emergent aquatic plants were found in this area: *Acorus* (Sweet Flag); *Asclepias* (Swamp Milkweed); *Carex* spp (Sedge); *Cicuta* (Water Hemlock); *Leersia* (Rice Cutgrass); *Onoclea* (Sensitive Fern); *Rumex* (Water Dock); and *Scutellaria* (Scullcap). Emergents provide important fish habitat and spawning areas, as well as food and cover for wildlife.

Free-floating plants included *Lemna minor* (Small Duckweed) and *Spirodela polyrrhiza* (Great Duckweed). These provide cover for fish and invertebrates and

are eaten by fish and waterfowl. *Nymphaea odorata* (White Water Lily), *Nuphar variegata* (Yellow Pond Lily) and *Polygonum amphibium* (Water Smartweed) were the rooted floating-leaf plants found. Floating-leaf vegetation provides cover and dampens waves, protecting the shore. Filamentous algae were common in this area.

A variety of submergent aquatic plant characterized this area. These included *Ceratophyllum demersum* (Coontail); *Chara* spp (Muskgrass); *Elodea canadensis* (Waterweed); *Myriophyllum sibiricum* (Northern Milfoil); *Myriophyllum spicatum* (Eurasian Watermilfoil); *Najas flexilis* (Bushy Pondweed); *Potamogeton natans* (Floating-Leaf Pondweed); *Potamogeton pectinatus* (Sago Pondweed); *Potamogeton zosteriformis* (Flat-Sem Pondweed); *Utricularia vulgaris* (Common Bladderwort); and *Zosterella dubia* (Water Stargrass). A diverse submergent community provides many benefits.

The only exotic invasive plant found in this area was Eurasian Watermilfoil. Most of the aquatic vegetation in this area has multiple uses for fish and wildlife (see Table 1). Because this site provides all three structural types of vegetation, the community has a diversity of structure and species that supports even more diversity of fish and wildlife.



Table 1: Aquatic Plant Benefits

	<u>Fish</u>	<u>Water</u>	<u>Shore</u>	<u>Upland</u>	<u>Muskrat</u>	<u>Beaver</u>	<u>Deer</u>
		<u>Fowl</u>	<u>Birds</u>	<u>Birds</u>			
<i>Carex spp</i>		F	F,I	-			
<i>Ceratophyllum demersum</i>	F,I,C,S	F,I,C			F		
<i>Chara</i>	F,S	F,I,C					
<i>Eleocharis spp</i>	F,I,C,S	F,I,C	F,C	F,C	F	F	
<i>Juncus spp</i>	F,I,C,S	F,I,C	F,C				
<i>Lemna minor</i>	F,I,C,S	F	F		F	F	
<i>Myriophyllum spp</i>	F,I,C,S	F,I	F		F		
<i>Najas spp</i>	F,C,I	F	F	F	F		
<i>Nuphar variegataa</i>	F,I,C,S	F	F		F	F	F
<i>Nymphaea odoratoa</i>	F,I,C,S	F	F		F	F	
<i>Phalaris arundinacea</i>		C					
<i>Polygonum amphibium</i>	C,I	F,I	F,I	F,I	F		F
<i>Potamogeton spp</i>	F,I,C,S	F,I	F		F	F	F
<i>Scirpus spp</i>	F,C,I	F,C	F,C,N	F	F	F	F
<i>Typha spp</i>	I,C,S	F	F,C,N		F,C,N	F	
<i>Spirodela polyrhiza</i>	F,I,C,S	F	F		F	F	
<i>Utricularia spp</i>	F,I,C,S						
<i>Zosterella dubia</i>	F,I,C	F					

F = Food; I = Shelters Invertebrates; C = Cover; S = Spawning; N = Nesting

RECOMMENDATIONS FOR AREA PE1

- (1) Maintain current habitat for fish and wildlife.
- (2) Do not remove fallen trees along the shoreline.
- (3) No alteration of littoral zone unless to improve spawning habitat.
- (4) Seasonal protection of spawning habitat.
- (5) Maintain snag/cavity trees for nesting.
- (6) Install nest boxes.
- (7) Maintain or increase wildlife corridor.
- (8) Maintain no-wake lake designation.
- (9) Protect emergent vegetation.
- (10) Minimize aquatic plant and shore plant removal to maximum 30' wide viewing/access corridor or for navigational purposes only. Leave as much vegetation as possible to protect water quality and habitat.
- (11) Use forestry best management practices.
- (12) No use of lawn products.
- (14) No bank grading or grading of adjacent land.
- (15) No additional pier placement, boat landings, development or other shoreline disturbance in the shore area of the wetland corridor.
- (16) No additional pier construction or other activity except by permit using a case-by-case evaluation and using light-penetrating materials.
- (17) No installation of pea gravel or sand blankets.
- (18) No bank restoration unless the erosion index scores moderate or high.
- (19) If the erosion index does score moderate or high, bank restoration only using biologs or similar bioengineering, with no use of riprap or retaining walls.
- (20) Placement of swimming rafts or other recreational floating devices only by permit.
- (21) Maintain buffer of shoreline vegetation.
- (22) Maintain aquatic vegetation in undisturbed condition for wildlife habitat, fish use and water quality protection.
- (23) Maintain sign for exotic species alert at boat landing.

Critical Habitat Area PE2

This area extends along approximately 800 feet of the shoreline along the middle south part of the lake. Sediment includes gravel, marl, muck, peat, and mixtures thereof. 35% of the shore is wooded; 10% is native herbaceous cover; the remaining shore is cultivated lawn and a little hard structure. Shallow marsh covers part of the shore. Large woody cover is common for habitat.



This area of abundant large woody cover, emergent aquatic vegetation, submergent and floating vegetation provides spawning and nursery areas for many types of fish: northern pike; largemouth bass; rock bass; bluegill; pumpkinseed; yellow perch; black crappie; bullhead; white suckers, and other panfish. All of these fish also feed and take cover in these areas. No exotic aquatic wildlife was noted in this area, i.e, no carp, smelt or rusty crayfish were seen. Some shore development was present in PE2.

Seen during the field survey were various types of songbirds. Frogs and salamanders are known to use this area for shelter/cover, nesting and feeding. Turtles and snakes also use this area for cover or shelter in this area, as well as nested and fed in this area. Upland wildlife feed and nest here as well.



Maximum rooting depth in PE2 was 8 feet. No threatened or endangered species were found in this area. One exotic invasive, *Myriophyllum spicatum* (Eurasian watermilfoil), was found in this area. Filamentous algae were present, especially near the shores. Only two types of emergents were found here: *Carex* and *Sparganium*. Emergents provide important fish habitat and spawning areas, as well as food and cover for wildlife.

Two floating-leaf rooted plants were present: *Nuphar variegata* and *Nymphaea odorata*. Floating-leaf vegetation provides cover and dampens waves, protecting the shore. Two free-floating plants, *Lemna minor* and *Spirodela polyrhiza*, were also at this site. The remaining aquatic plants were submergents; *Chara* spp., *Myriophyllum sibiricum*, *Myriophyllum spicatum*, *Najas flexilis*, and *Potamogeton friesii*. A diverse submergent community can provide many benefits. All of these plants have multiple fish and wildlife uses (see Table 2).

Table 2: Aquatic Plant Benefits

	<u>Fish</u>	<u>Water</u>	<u>Shore</u>	<u>Upland</u>	<u>Muskrat</u>	<u>Beaver</u>	<u>Deer</u>
		<u>Fowl</u>	<u>Birds</u>	<u>Birds</u>			
<i>Carex spp</i>		F	F,I	-			
<i>Chara</i>	F,S	F,I,C					
<i>Lemna minor</i>	F,I,C,S	F	F		F	F	
<i>Myriophyllum spp</i>	F,I,C,S	F,I	F		F		
<i>Najas spp</i>	F,C,I	F	F	F	F		
<i>Nuphar variegataa</i>	F,I,C,S	F	F		F	F	F
<i>Nymphaea odoratoa</i>	F,I,C,S	F	F		F	F	
<i>Potamogeton spp</i>	F,I,C,S	F,I	F		F	F	F
<i>Scirpus spp</i>	F,C,I	F,C	F,C,N	F	F	F	F
<i>Spirodela polyrhiza</i>	F,I,C,S	F	F		F	F	
<i>Sparganium spp</i>	F,I,C,S	F,C,N	F,C,N		F		F

F = Food; I = Shelters Invertebrates; C = Cover; S = Spawning; N = Nesting

RECOMMENDATIONS FOR PE2

- (1) Maintain current habitat for fish and wildlife.
- (2) Do not remove fallen trees along the shoreline.
- (3) No alteration of littoral zone unless to improve spawning habitat.
- (4) Seasonal protection of spawning habitat.
- (5) Maintain snag/cavity trees for nesting.
- (6) Install nest boxes.
- (7) Maintain or increase wildlife corridor.
- (8) Maintain no-wake lake designation.
- (9) Protect and, if possible, enhance emergent vegetation.
- (10) Minimize aquatic plant and shore plant removal to maximum 30' wide viewing/access corridor or for navigational purposes only. Leave as much vegetation as possible to protect water quality and habitat.
- (11) Use forestry best management practices.
- (12) No use of lawn products.
- (14) No bank grading or grading of adjacent land.
- (15) No additional pier placement, boat landings, development or other shoreline disturbance in the shore area of the wetland corridor.
- (16) No additional pier construction or other activity except by permit using a case-by-case evaluation and using light-penetrating materials.
- (17) No installation of pea gravel or sand blankets.
- (18) No bank restoration unless the erosion index scores moderate or high.
- (19) If the erosion index does score moderate or high, bank restoration only using biologs or similar bioengineering, with no use of riprap or retaining walls.
- (20) Placement of swimming rafts or other recreational floating devices only by permit.
- (21) Maintain buffer of shoreline vegetation where present. Install buffer where there is currently cultivated lawn.
- (22) Maintain aquatic vegetation in undisturbed condition for wildlife habitat, fish use and water quality protection.
- (23) Maintain sign for exotic species alert at boat landing